

**REMARKS**

The Office Action mailed on November 03, 2003, has been reviewed and the comments of the Patent and Trademark Office have been considered. Prior to this paper, claims 24-39 were pending in the present application. By this paper, Applicants do not add or cancel any claims. Therefore, claims 24-39 remain pending in the present application.

Applicants respectfully submit that the present application is in condition for allowance for the reasons that follow.

**Power of Attorney**

Applicants provide a copy of a signed Power of Attorney form attached in Appendix A to permit the law firm of Foley and Lardner to prosecute the present application. However, Applicants request that all future correspondence concerning this application be sent to:

Romain L. Billiet and Hanh Thi Nguyen  
135A Malacca Street  
10400 Penang, Malaysia

Still, if Examiner Tran believes that a telephone interview with Applicants representative will advance prosecution, Examiner Tran is welcome to contact Martin Cosenza at (202) 295-4747.

**Indication of Allowable Subject Matter**

Applicants thank Examiner Tran for the indication that claims 34 and 37 contain allowable subject matter.

**Claim Rejections Under 35 U.S.C. §103(a)**

In the Office Action, Claims 24-33, 35, 36 and 38 are rejected under 35 U.S.C. §103(a) as being unpatentable over Amaya (USP 5,976,457) in view of Wiech (USP 5,234,655), with claim 39 being rejected under the same statute in view of the just mentioned combination plus Ryuhgoh (USP 5,432,224). Applicants respectfully traverse the rejection as to the claims above, and submit that these claims are allowable for at least the following reasons.

Applicants rely on MPEP § 2143, which states that:

[t]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

It is respectfully submitted that at least the second and third criteria of MPEP § 2143 have not been met in the Office Action.

**Lack of Suggestion or Motivation to Modify or Combine the References**

MPEP § 2143.01 states that “the prior art *must* suggest the desirability of the invention.” (MPEP § 2143.01, subsection 1, emphasis added.) It is respectfully submitted that the Office Action fails to contain a proper motivation to combine the references.

The Office Action relies entirely on advantages obtained by practicing Wiech alone for a motivation to combine Wiech and Amaya. Applicants respectfully submit that if the advantages of Wiech could be obtained alone, there is no motivation to combine Wiech with another reference. The Office Action states that “it would have been obvious . . . to provide ceramic powder as taught by Wiech, Jr., in Amaya et al since size, packing density, heat dissipation, complex interconnection problems are substantially reduced.” (Office Action,

page 03, final paragraph.) Immediately prior to this statement<sup>1</sup>, the Office Action identifies columns 3, lines 1-6 of Wiech at teaching these allegedly advantageous features. That is, by practicing Wiech alone, these alleged advantages may be obtained. Thus, one of ordinary skill in the art seeking these alleged advantages would look to Wiech as satisfying the sought after advantages, and would not be motivated to look any further, such as to Amaya, all else being equal.

Still further, no evidence or rationale has been proffered in the Office Action to support the premise that these alleged advantages are advantages of molds made by the combination of Wiech and Ayama. The above mentioned advantages taught by Wiech are always taught with reference towards ceramic substrates. (See Wiech, col. 3, lines 1-8.) That is, the recited advantages in Wiech are applicable to substrates, and there is no teaching that the advantages are applicable to molds. Wiech is, in fact, completely silent in regard to the applicability of these advantages to molds, and the Office Action fails to proffer any evidence or rationale to such applicability. Thus, without the proffered advantages, the proffered motivation to combine the references necessarily fails.

Moreover, assuming *arguendo* that the alleged advantages of Wiech would have been known to the skilled artisan, Applicants submit that the very fact that Amaya, who filed his application in 1997, *a full four years after* the publication of Wiech and thus presumably had full knowledge of the alleged advantages of Wiech, fails to teach injection of ceramic powder despite the fact that he had knowledge of ceramics,<sup>2</sup> is *prima facie* evidence that the skilled artisan would not have been motivated to seek out Wiech for combination with Amaya. Amaya only teaches the manufacture of molds with *metal powders*.<sup>3</sup> It is respectfully submitted that since Amaya, who had full knowledge of Wiech, does not disclose, teach, or suggest the use of ceramic powders to make mold components, despite the alleged “advantages” of practicing Wiech, it would have been an inventive step to combine the two references, a step that would not have been undertaken by the ordinary artisan. This is further

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<sup>1</sup> See last sentence of the second full paragraph on page 03 of the Office Action.

<sup>2</sup> See abstract of Amaya.

<sup>3</sup> Amaya was aware of the use of ceramics, as he states that molds made according to his teachings from metal powder that can be used to make ceramic parts. In spite of this, he did not disclose, teach, or even suggest that an injection molding ceramic powder process could be used to make his molds.

demonstrated by the fact that Amaya teaches away from the use of his process to make ceramic molds. At column 8, lines 41-44, Amaya states that remaining polymer would be removed to produce "a debound mold or part consisting only of the metal powders." (Emphasis added.) That is, one of ordinary skill in the art would be discouraged from seeking out non-metal powders. Therefore, the present invention is not obvious in view of Amaya and Wiech.

Also, Wiech and Amaya are from different fields of art, the former being in the "plastics and non-metallic shaping fields," the latter being in the metallurgical field, as is evidenced by the art classes to which each patent has been assigned (200 and 400 series, respectively). As was noted in the last response, skill in ceramic injection molding is not intrinsically concomitant with skill in metal injection molding, the former requiring more specialized skills owing to the radically different properties, powder morphology and processibility of ceramic materials used in ceramic injection molding. Indeed, these radical differences provide another reason why the use of ceramic injection molding of Wiech in the process of Amaya (setting all other issue aside) is inventive and not obvious. Because one of ordinary skill in the metal injection mold arts would not know of Wiech (as is evidenced by Amaya's failure to implement or even suggest the use of Wiech in his teachings), it would have been an inventive step and not an obvious step, to combine the two references.

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Applicants submit that the fact that 1) metal and ceramic injection molding has been known since the early 1970s, and 2) mold wear/longevity has been a problem since the 1920s, is evidence of the non-obviousness of the present invention. That is, there has been a long felt need to improve the quality of molds, during which time ceramic injection molding was available for use in fulfilling that need, but no one thought to utilize ceramic injection molding to make molds, as is evidenced by the fact that there is no anticipatory reference on record. It was not until 1997 that Amaya thought to make mold inserts through metal injection molding, and his lack of a teaching of the use of ceramic injection molding is evidence of the non-obviousness of the invention. If the combination of Wiech with Amaya would yield the alleged advantages proffered in the Office Action, surely someone would

have done so by now if such a combination was obvious, considering the fact that the teachings of these two reference have been available for eleven and four years, respectively. Instead, just the contrary has occurred; no one other than the Applicants has thought to produce molds as claimed. This is yet another reason why it would not have been obvious to combine Wiech and Amaya at the time of applicants' invention.

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MPEP § 2143.01, subsection 6 states that “the proposed modification cannot change the principle of operation of a reference – If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810 (CCPA 1959).” In *Ratti*, the CCPA held that the “suggested combination of references would require a substantial reconstruction and redesign of the elements shown in the primary reference.” This substantial redesign would have resulted in changing a rigid seal to a resilient seal. Thus, a reference cannot be modified to render an invention obvious if the modification changes the principle of operation of the reference, **even if that modification is workable or easily implemented.**

With the above in mind, it is respectfully submitted that since Amaya teaches making molds from the injection of metal powder, substituting metal powder with ceramic powder would change the principle of operation of Amaya. Since modifying Amaya to utilize ceramic powder changes the principle of operation of Amaya, “the teachings of [Amaya] are not sufficient to render the claims *prima facie* obvious.”

#### Lack of a Reasonable Expectation of Success

MPEP § 2143.02 permits references to be modified or combined to reject a claim as obvious **only** if there is a reasonable expectation of success. There is no evidence in the references, and certainly none identified in the Office Action, that one of ordinary skill in the art would have a reasonable expectation of success in achieving Applicants' invention by combining the references. For example, the references are silent in regard to a teaching that the artisan of ordinary skill would have expected ceramic powder to be successfully utilized

in Amaya, as proffered in the Office Action. (Applicants note that this example is simply a starting point for a showing of a reasonable expectation of success; more would be needed.) Indeed, as noted above, ceramic injection molding requires more specialized skills owing to the radically different properties, powder morphology and processibility of ceramic materials used in ceramic injection molding. By way of example only, it is well known that ceramic powders are very abrasive. No evidence has been proffered by the PTO that the use of such abrasive powders in Amaya would be successful, as the teachings of Amaya are entirely directed towards the use of metal powders. This is, in fact, evidence that the art teaches skepticism regarding the use of ceramic powders to injection mold molds.

Further, as noted above, the teachings of Wiech identified in the Office Action as resulting in advantages are entirely directed towards substrates. Substrates are used for mounting electronic/semiconductor components, and are well known to have open tolerances. The overall outside dimensions of substrates are not critical and are often trimmed to match other components after fabrication. Thus, one of ordinary skill would look at the teachings of Wiech and not expect to successfully be able to implement Wiech in Amaya to produce high tolerance molds.

Thus, one of ordinary skill in the art would not see the combination of the references as successfully producing acceptable molds. Because of this, the second criteria of MPEP § 2143 has not been met in the Office Action, a *prima facie* case of obviousness has therefore not been established.

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Because a *prima facie* case of obviousness has not been established against independent claim 24, claim 24 and its dependencies are allowable. As Ryuhgho fails to remedy the deficiencies of the combination of Amaya and Wiech in regards to establishing a *prima facie* case of obviousness, claim 39 is likewise allowable.

**CONCLUSION**

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Examiner Tran is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

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